UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/537,948	03/29/2000	James David Johnston	1999-0104	7042

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EXAMINER
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ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _29 March 2000_.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-12_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-12_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on _29 March 2000_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a) ☐ All b) ☐ Some * c) ☐ None of:

   1. ☐ Certified copies of the priority documents have been received.

   2. ☐ Certified copies of the priority documents have been received in Application No. _____.

   3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _3/29/00_.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1, 4, 5, 7 and 10 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Grill et al. (Grill), U.S. Patent No. 6,370,507, Said, U.S. Patent No.

5,075,619, and Gilmore, U.S. Patent 5,128,623.

3.   Regarding claim 1, see Grill

A method of deploying filters for use in processing audio signals, comprising:
calculating a filter for each of a plurality of frequency bands; (Col. 4, lines 20-35).
determining a distance between coefficients of filters in adjacent frequency bands;
and merging filters with a shortest distance between coefficients.

Grill teaches a frequency-domain coding apparatus and method. They teach the use of

filter banks for use in a high sampling frequency coder. Grill does not teach the steps of

determining a distance between coefficients, nor do they teach the merging of filters. In

an analogous art, Said teaches a spectrum analyzer where a filter bank is employed.

Said teaches the use of a filter bank and it is inherent that the filters are calculated

beforehand. Gilmore teaches a frequency synthesizer that is capable of providing fine

frequency resolution over a large bandwidth. Gilmore teaches the substitution of one

bandpass filter for a plurality of bandpass filters (Col. 5, lines 48-50, and Figure 1, units

50_1-50_K and Figure 2, unit 138). Gilmore indirectly teaches merging the filters with a

shortest distance by combining all filters in the filter bank into one bandpass filter. It

would have been obvious for one of ordinary skill in the art to combine the teachings of

Grill, Said and Gilmore for the purpose of reducing circuit complexity (Said, Col. 2, lines

5-13).

4.   Regarding claim 4, the further limitation of claim 1, see the preceding argument

regarding claim 1.

*... wherein said merging involves calculating a new filter for a frequency range consisting of said adjacent
frequency bands of said filters with said shortest distance.*

Said teaches the feature of reducing a filter bank's number of filters by time sharing, and

Gilmore teaches the feature of replacing a filter bank with one bandpass filter. It is

inherent that Gilmore's teachings imply that the replacement of the filter bank with a

bandpass filter requires a recalculation of coefficients for the new filter. It is further

inherent that the combination of Grill, Said, and Gilmore teaches that any merging of

filters, requires a recalculation of coefficients for the new frequency range covered by

two or more adjacent filters in a filter bank.

5.   Regarding claim 5, see the preceding argument with regard to claim 1.

A method of deploying filters for use in processing audio signals, comprising:
a) calculating a filter for each of a plurality of frequency bands,
b) comparing coefficients of filters in adjacent frequency bands to identify a pair of filters with a shortest
Euclidean distance between coefficients;
c) merging said pair of filters;
d) repeating steps a) through c) until a predetermined number of total filters is reached.

The combination of Grill, Said, and Gilmore teach these features.

6.   Regarding claim 7, the further limitation of claim 5, see the preceding argument

of claims 1, 4, and 5. The combination of Grill, Said, and Gilmore teach the calculation

of a merged filter's coefficients.

7.   Regarding claim 10, see Said

A method of deploying a filter for use in processing audio signals comprising:
determining a first filter for a first frequency range;
determining a second filter for a second frequency range, said second frequency range involving said first frequency range; (Col. 4, lines 47-53).
calculating a first Euclidean distance using coefficients of said first filter;
calculating a second Euclidean distance between coefficients of said first filter and coefficients of said second filter;
calculating a first prediction gain using said first filter;
calculating a second prediction gain between said first filter and said second filter; and
if said second Euclidean distance is greater than said first Euclidean distance and said second prediction gain is less than said first prediction gain, then deploying said first filter for said first frequency range.

Said teaches the use of overlapped filters. He does not teach the method of calculating

a distance, however it is obvious to one skilled in the art that it is the basic measure of

error. It is also obvious to one skilled in the art that the prediction gain (i.e. signal

energy divided by error energy) is the basic measure of quality in a predictive coder.

The method of choosing one filter over another is obvious to one skilled in the art.

8.   Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Grill, Said, and Gilmore as applied to claim 1 above, and further in view of Araki, U.S.

Patent No. 6,456,963.

9.   Regarding claim 2, the further limitation of claim 1, see Araki

... wherein said filters are TNS filters. (Col. 2, lines 17-18, and lines 31-32 and Col. 4, lines 56-63).

Araki teaches a method of selecting between long and short block lengths in a

perceptual coder. Araki teaches the use of filter banks in a perceptual coder for the

AAC standard (Fig. 2, unit 73). He does not teach the steps of determining distance or

merging as claimed in the parent claim. The combination of Grill, Said, and Gilmore

teach the features of claim 1, the parent claim. It would have been obvious for one of

ordinary skill in the art to combine the teachings of Araki and the combination of Grill,

Said, and Gilmore for the purpose of better perceived quality.

10.   Regarding claim 11, the further limitation of claim 10, see the preceding

arguments with regards to claims 1, 2, and 10.

... wherein said first and second filters are TNS filters.

Araki teaches the use of TNS filters.

11.   Claim 3, 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Grill, Said, and Gilmore as applied to claim 1 above, and further in view of

Damoulakis et al. (Damoulakis), U.S. Patent No. 4,720,802.

12.   Regarding claim 3, the further limitation of claim 1, see Damoulakis

... wherein said coefficients are PARCOR coefficients. (Col. 4, line 62 - Col. 5, line 4).

Damoulakis teaches a noise compensator in a speech coder, which employs the use of

partial correlation (PARCOR) coefficients. Damoulakis further teaches that filter banks

could be employed in a frequency analysis situation, however they do not teach the

steps of determining distance and merging as claimed in the parent claim. The

combination of Grill, Said, and Gilmore teach the features of claim 1. It would have

been obvious for one of ordinary skill in the art to combine the teachings of Damoulakis

with the combination of Grill, Said, and Gilmore for the purpose of more efficient coding.

13.   Regarding claim 6, the further limitation of claim 5, see the preceding argument

with regards to claims 1, 3, and 5. The combination of Grill, Said, Gilmore, and

Damoulakis teach the features of claim 6.

14.   Regarding claim 12, the further limitation of claim 10, see the preceding

arguments with regard to claims 1, 3, and 10.

... wherein said coefficients are PARCOR coefficients.

Damoulakis teaches the use of PARCOR coefficients.

15.   Claim 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Grill, Said, and Gilmore as applied to claim 5 above, and further in view of Streb, U.S.

Patent No. 3,568,144.

16.   Regarding claim 8, the further limitation of claim 5, see Streb

... further comprising:
after said predetermined number of filters is reached, recalculating at least one of said filters using only
those frequencies corresponding to a strongest signal within a frequency range covered by said at least
one of said filters; and (Col. 2, lines 20-25).
using said recalculated filter for an entire extent of said frequency range.

In an analogous art, Streb teaches a sound viewer apparatus utilizing a bank of filters.

The filters are calculated individually for a signal signature in the band of frequencies

each filter covers. The bandpass region of these filters corresponds to the strongest

signal of interest in the bandpass region. Streb does not teach the features of

determining a distance between filter coefficients, nor does She teach the step of

merging filters. The combination of Grill, Said, and Gilmore teach these features. It

would have been obvious for one of ordinary skill in the art to combine the teachings of

Streb with the combination of Grill, Said, and Gilmore for the purpose of improving the

perceived quality of the coder.

17.   Regarding claim 9, the further limitation of claim 8, see the preceding argument

of claim 8, and

... wherein said strongest signal is identified based on energy/bin within said frequency range.

It is obvious to one skilled in the art that the strongest signal is identified in the

frequency domain based on energy per frequency bin.

Conclusion

18.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Malvar, U.S. Patent No. 6,115,689.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Daniel R. Sellers whose telephone number is 703-605-

4300. The examiner can normally be reached on Monday to Friday between 9am and

5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Sinh Tran can be reached on 703-305-4040. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

SINH TRAN
SUPERVISORY PATENT EXAMINER

DRS